Horner, N. V. 1975. Annual aerial dispersal of jumping spiders in Oklahoma (Araneae, Salticidae). J. Arachnol. 2:101-105.

ANNUAL AERIAL DISPERSAL OF JUMPING SPIDERS IN OKLAHOMA (ARANEAE, SALTICIDAE)[1]

Norman V. Horner

Department of Biology
Midwestern University
Wichita Falls, Texas 76308

ABSTRACT

An annual dispersal study of jumping spiders (Araneae: Salticidae) was conducted at Oklahoma State University, Stillwater. A total of 215 spiders, representing 12 gerera, were collected from two Johnson-Taylor suction traps. Of these, 190 (ca. 88%) were immature. The remainder included 18 males and seven females. Dispersal was detected each month of the year except January.

INTRODUCTION

Available information on spider dispersal includes data on the process of ballooning (Blackwall, 1827, and McCook, 1877), climatic conditions (Emerton, 1908; Bristowe, 1929; Freeman, 1946), height records, (Crosby and Bishop, 1936; Glick, 1939, 1960), and dispersal of known spider populations (Duffey, 1956). Little information is available on the seasonal dispersal of given families. The present study was designed to determine the dispersal trends, monthly dispersal rate, and identification of ballooning spiders in the family Salticidae during one year. At least seven other families were collected but the individuals have not been identified.

MATERIALS AND METHODS

Aerial dispersal of salticids was studied by collecting immature and adult forms in two Johnson-Taylor suction traps. The suction traps were capable of pulling air into the trap from several feet above and around the opening. A fine mesh funnel screen terminated in a one-pint jar. Specimens were trapped, killed and preserved in the jar which contained 80% ethyl alcohol.

Trap No. 1 was located on top of a building (ca. 50 ft.) on the main campus at Oklahoma State University, Stillwater. The surrounding area consisted of streets parking lots and campus buildings. Vegetation in the area was that of the landscaped campus (shrubs, trees, and grass). The second trap, No. 2, was on a 10 ft. roof of the Insectary. This placed the opening about 17 ft. above ground level. The Insectary is one mile west of the main campus. Vegtation to the south and east consisted of experimental station test crops of sorghum, small grain, etc. Southeast and west of the trap stretched pecan orchards, catalpa grove, and native vegetation. To the north, most of the vegetation was native grass.

[1] This research was supported in part by Midwestern University Research Foundation Grant MU-1532.

Salticids were separated from other spiders and insects in the trap samples, then stored in 70% ethyl alcohol. Samples were made daily during late spring, summer, and early fall due to rapid rate of alcohol evaporation and heavy insect populations. During the remainder of the year, samples were taken every 3 or 4 days. During times of heavy rainfall, some samples were lost when the alcohol was diluted to the point that preservation did not occur.

RESULTS AND DISCUSSION

Table 1 presents the taxa, number and ontogenetic stage of salticids collected from each of the two traps. The traps yielded 215 specimens, of which 190 were immature and of indeterminate sex, 18 were mature males and 7 mature females. The vast majority of the immatures were very early instar (probably second). This was expected since, early instars are the common ballooners. Although the number of adults taken was small, the data show that some adults of the smaller salticids do use ballooning as a means of dispersal.

Table 1.–Number and ontogenetic stage of salticids collected from Johnson-Taylor suction traps.

Taxa	Immature	Mature Male	Female	Total Specimens	Immature	Mature Male	Female	Total Specimens
	Trap No. 1				Trap No. 2			
Icius sp.	19			19	5			5
Hentzia ambigua (Walckenaer)	10	3	2	15	5	4		9
Marpissa pikei (Peckham)	1	2		3				
Habronattus sp.	10			10	15			15
Metaphidippus sp.	13			13	7			7
Phidippus sp.	41			41	26			26
Metaphidippus unknown sp.		1		1				
Metaphidippus galathea (Walckenaer)	12	6	3	21	6	2	1	9
Eris sp.	2			2	2			2
Eris marginatus (Walckenaer)			1	1				
Tutelina sp.	6			6	2			2
Salticus sp.	1			1	5			5
Peckhamia sp.					1			1
Gertschia					1			1
GRAND TOTAL				133				82

The genus *Phidippus* was represented by a total of 67 specimens, followed by 50 for *Metaphidippus*, 25 for *Habronattus* and 24 for *Hentzia*. Species of *Peckhamia* and *Gertschia* were each collected once. These latter two were only collected in the higher trap.

Of the total spiders collected in the traps 13.5% of those in trap No. 1 were adults compared to 8.5% in trap No. 2. This is probably due to the difference in height of the traps. The adults are heavier and may not drift so high as the spiderlings.

Table 2 shows ontogenetic stage and number of each taxon for each month. July had the greatest number with 62 individuals, followed by November with 31. June, August

and October had 28, 29 and 29 respectively. Winter and early spring months yielded fewer than 10 each month, and January yielded none.

Table 2.–Taxa of salticids collected monthly from Johnson-Taylor suction, traps, Stillwater, Oklahoma. I = Immature, F = Female, M = Male

Month	Taxon	Stage	Number Collected	Monthly Total
January 1971				
	(None Collected)			0
February 1971				
	Phidippus sp.	I	3	3
March 1971				
	Hentzia ambigua (Walckenaer)	M	1	1
April 1971				
	H. ambigua	I	1	
	Phidippus sp.	I	2	3
May 1971				
	Metaphidippus galathea (Walckenaer)	I	2	
	Tutelina elegans (Hentz)	I	2	
	Habronattus sp.	I	1	
	H. ambigua	I	1	
	Phidippus sp.	I	2	8
June 1970				
	Icius sp.	I	9	
	H. ambigua	F	1	
	H. ambigua	M	1	
	Marpissa pikei (Peckham)	M	1	
	Habronattus sp.	I	4	
	Metaphidippus sp.	I	4	
	Phidippus sp.	I	4	
	M. galathea	I	1	
	Eris sp.	I	1	
	M. galathea	M	1	
	T. elegans	I	1	28
July 1970				
	Icius sp.	I	7	
	Phidippus sp.	I	35	
	Habronattus sp.	I	7	
	Metaphidippus sp.	I	7	
	Peckhamia sp.	I	1	
	Salticus sp.	I	1	
	M. pikei	M	1	
	Hentzia sp.	I	1	
	M. galathea	M	1	
	Metaphidippus sp.	M	1	62
August 1970				
	Phidippus sp.	I	7	
	M. galathea	I	5	
	Metaphidippus sp.	I	2	
	M. galathea	M	4	
	M. galathea	F	2	
	Habronattus	I	4	
	Icius sp.	I	4	
	Eris sp.	I	1	29

Table 2.-Continued

Month	Taxon	Stage	Number Collected	Monthly Total
September 1970				
	Icius sp.	I	2	
	Phidippus sp.	I	2	
	Metaphidippus sp.	I	3	
	M. galathea	F	2	
	M. galathea	I	2	
	H. ambigua	F	1	
	Hentzia	I	1	
	Habronattus sp.	I	3	
	Gertschia sp.	I	1	17
October 1970				
	Habronattus sp.	I	5	
	Metaphidippus sp.	I	1	
	M. pikei	I	1	
	Icius sp.	I	2	
	Phidippus sp.	I	6	
	Eris sp.	I	1	
	E. marginatus (Walckenaer)	F	1	
	Hentzia sp.	I	3	
	H. ambigua	M	4	
	Tutelina sp.	I	2	
	M. galathea	I	2	
	Salticus sp.	I	1	29
November 1970				
	Hentzia sp.	I	6	
	H. ambigua	M	1	
	Salticus sp.	I	3	
	Phidippus sp.	I	6	
	Metaphidippus sp.	I	3	
	M. galathea	I	6	
	M. galathea	M	2	
	Eris sp.	I	1	
	Tutelina sp.	I	2	
	Habronattus sp.	I	1	31
December 1970				
	Hentzia sp.	I	3	
	Tutelina sp.	I	1	4

It is difficult to establish specific trends for the species listed. In general it seems that salticids are active annually, at least under climatic conditions present in this area of Oklahoma. Through no salticids were collected in January, some dispersal probably occurs then since a few were collected in December and February.

The Johnson-Taylor suction traps are well adapted to this type of survey. Some spiders may have been overlooked in the sorting process and some samples were lost to spoilage during periods of heavy precipitation. Further study of aerial dispersal is desired. Needed information about the relationship between specific climatic conditions and individual species dispersal habits can be obtained with the suction traps.

ACKNOWLEDGEMENTS

Grateful acknowledgment is extended to Dr. K. J. Starks, Entomologist, Entomology Research Division, Agricultural Research Service, USDA and Entomology Department, Oklahoma State University, Stillwater for the use of their Johnson-Taylor suction traps. Special thanks are due to Dr. C. D. Dondale who identified some of the spiders.

LITERATURE CITED

Blackwall, J. 1827. Observations and experiments made with a view to ascertain the means by which the spiders that produce gossamer effect their aerial excursions. Trans. Linn. Soc. London 15:449-459.

Bristowe, W. S. 1929. The distribution and dispersal of spiders. Proc. Zool. Soc. London 99:633-657.

Crosby, C. R., and S. C. Bishop. 1936. Aeronautic spiders with a description of a new species. J. New York Entomol. Soc. 44:43-49.

Duffy, E. 1956. Aerial dispersal in a known spider population. J. Anim. Ecol. 25:85-111.

Emerton, J. H. 1908. Autumn fight of spiders. Psyche 15:121.

Freeman, J. A. 1946. The distribution of spiders and mites up to 300 feet in the air. J. Anim. Ecol. 15:69-74.

Glick, P. A. 1939. The distribution of insects, spiders, and mites in the air. U. S. Dept. Agr. Tech. Bull. 673:1-150.

Glick, P. A. 1960. Collecting insects by airplane with special reference to dispersal of the potato leafhopper. U. S. Dept. Agr. Tech. Bull. 1222:1-16.

McCook, H. C. 1877. The aeronautic flight of spiders. Proc. Philadelphia Acad. Nat. Sci. 29:308-312.